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EFFICIENT HUMIDIFIERS FOR CONTROLLED CABINETS

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An atomizer operated by compressed air is often used to control the humidification of small experimental temperature cabinets. This method is satisfactory when compressed air is available and the cost of operation is not a factor.

The humidifier (fig. 1) described below operates over a wide range of humidities. It is made from a unit sold commercially for cooking eggs or warming baby bottles. In this type of unit the heating effect depends on the conductivity of the water, so in case the heating unit boils dry no damage will result to the heating element. This heating unit is connected so as to operate when a humidistat, in connection with a relay, closes the circuit. The water in the unit is then vaporized by the generated heat.

In places where distilled or snow water is used it will be necessary to add 15 to 20 milligrams of magnesium sulphate or some other nonchlorine salt per liter of water.

A constant level of water is maintained in the humidifier by means of an aspirator bottle or similar device. The water reservoir shown in the illustration was made by connecting a 10-inch piece of 20-mm. glass tubing to a 2-liter balloon flask and inserting the unit in the humidifier. The height of the reservoir should be set to maintain at least one-half inch of water in the heating unit. When the 20-mm. glass tubing is drawn to a 10-mm. point it is much easier to maintain the constant level in the heating unit. The large tubing is used to permit free passage of air into the reservoir.

It will be necessary to insert a resistance coil (100 to 200 watts) in series with the humidifier in cabinets with nonpervious lining, but if used with absorbent material such as untreated cane board the resistance is not required.

At present two of the units are being used in two different types of cabinets, one (wooden frame with glass on five sides, of the Hottes type, 45 cubic feet capacity) operating at 62.5° F. and 80 percent relative humidity, and the other (treated cane board, 25 cubic feet capacity) operating at 80° F. and 60 percent relative humidity. In the first cabinet a 100-watt coil is being used in series and in the second a 150-watt coil is satisfactory.

Another type of humidifier has been found to be quite satisfactory, especially for small cabinets or for larger cabinets when lower humidity is desired. The same type of water reservoir is used, but the heating unit is an ordinary electric light bulb (40 w.) partially immersed in a calcium chloride solution. The light bulb is operated with a suitable humidistat in connection with a relay. The container for the calcium chloride solution should be small in proportion to the size of the cabinet. A 6-inch enameled pan has proved to be satisfactory in a cabinet of 45 cubic feet capacity operating at 40 percent relative humidity and 89° F. Anhydrous calcium chloride is added to the vessel at the rate of 56 grams per liter.

The heat from the light bulb will raise the vapor pressure of the solution sufficiently to humidify the cabinet.

The two types of humidifiers have been used with entire satisfaction. The choice depends entirely upon the conditions to be maintained.

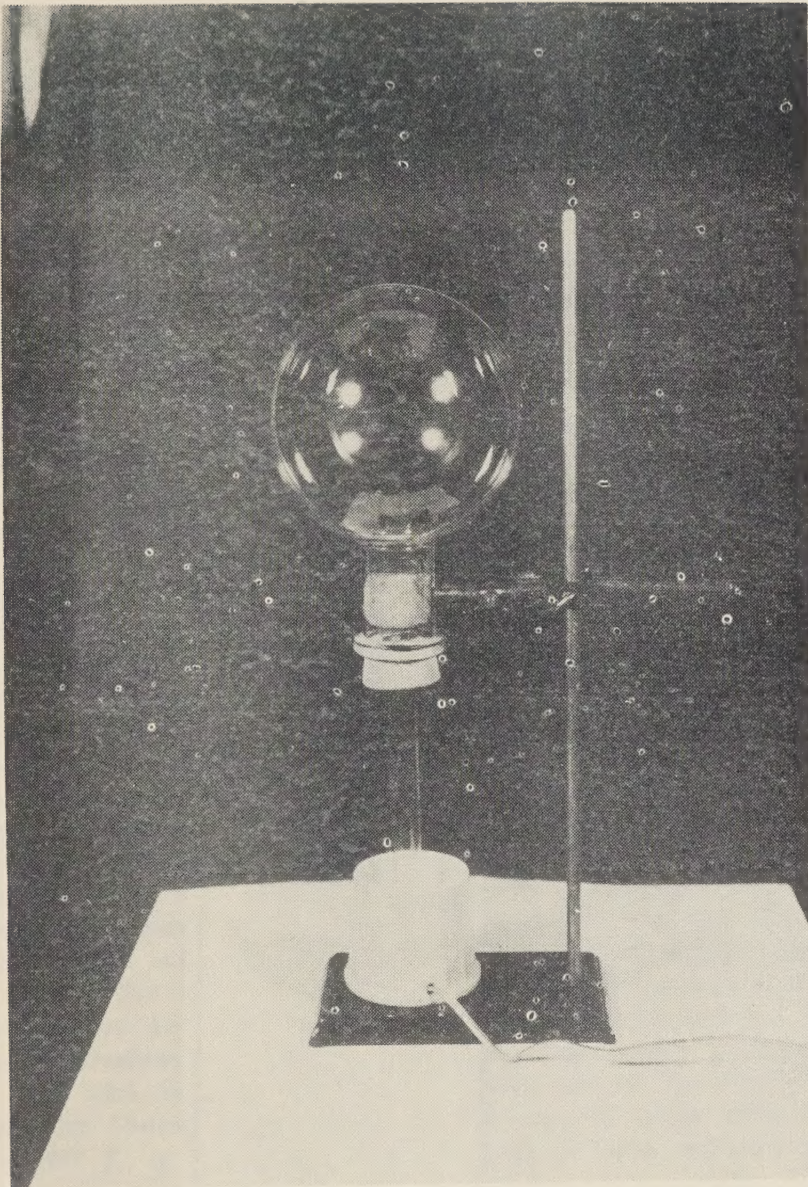


Figure 1.--Humidifier, showing assembled unit.

